Nov. 3, 1959 T. J. SWENSON 2,911,345

ARTICLE COATING

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Fig. 1

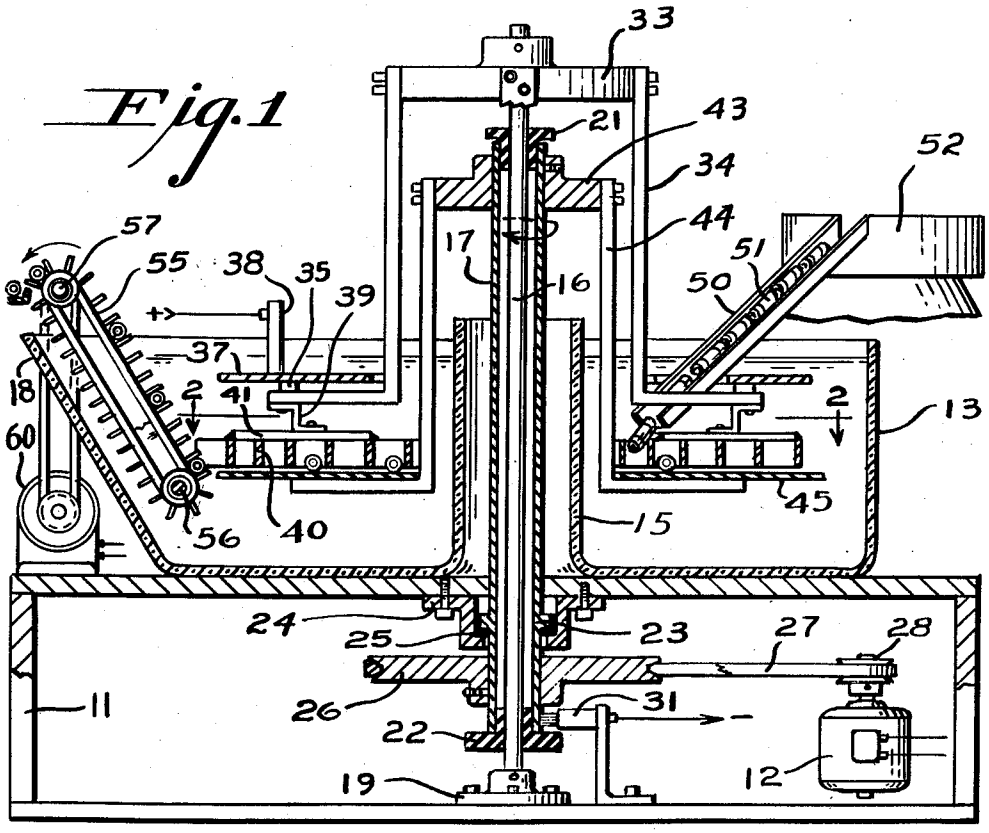
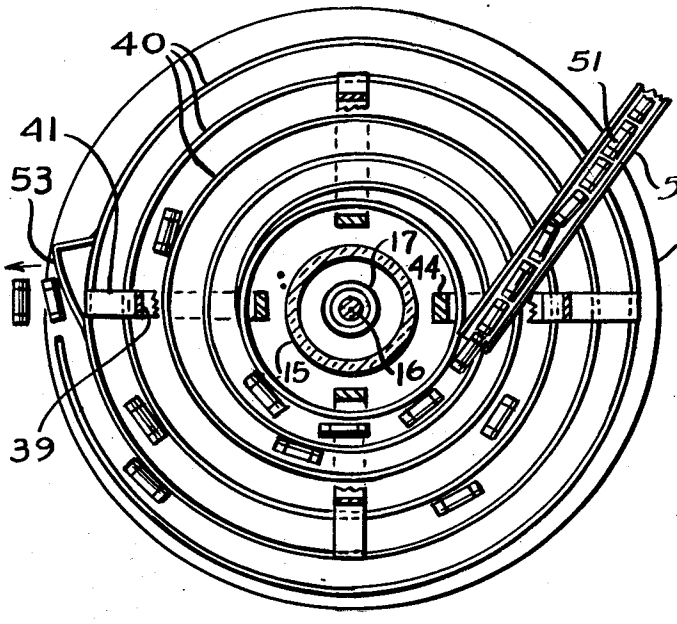


Fig. 2



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ARTICLE COATING

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5 Claims. (Cl. 204—201)

The present invention relates to article coating and particularly to the electrodeposition of metallic coatings upon small circular bodies, such for example as short sections of a circular metal rod, the previously metallized circular bands about rods of dielectric material, or spherical bodies such as ball bearings and the like.

It is highly desirable that the coating be of uniform thickness, and to attain such results systems have heretofore been devised for rolling cylindrical bodies along a linear plating bath over the cathode of the plating bath.

According to the present invention a system is provided wherein the plating bath contains a cathode in the form of a rotatable support or table. The table rotates continuously and the articles are deposited thereon in succession in end to end relation near its center and tangential with respect to its axis, between adjacent convolutions of a stationary clockwise wound spiral fence suspended just clear of the table top. The respective convolutions of the fence are spaced with respect to one another in accordance with the dimensions of the articles to be plated. When linear articles are to be plated such spacing is that required to maintain them substantially tangential to the table axis throughout the plating cycle. As the table rotates in a clockwise direction the deposited articles, while rotating with the table, are forced by the fence to substantially continuously roll toward its outer margin. As the outer end of the fence is cleared by an article it is deflected from the table onto a conveyor that removes it from the bath.

For a better understanding of the invention reference is made to the accompanying drawing wherein:

Fig. 1 is a sectional elevation of an apparatus embodying the invention, illustrating a fragment of a typical form of apparatus feeding articles thereto, and also illustrating its take-out mechanism.

Fig. 2 is a view taken on line 2—2 of Fig. 1.

Referring to the drawing in detail, the apparatus is arranged on a supporting base or box 11 containing a table drive motor 12. Arranged on the box 11 is a circular container 13 having within its central region an upstanding tubulation 15, and a lip 18.

Passing through tubulation 15 is a stationary shaft 16 surrounded by a rotatable sleeve 17. Shaft 16 at its lower end is rigidly anchored to the bottom of the box 11 by means of a floor flange 19. The sleeve 17 is held concentrically spaced about shaft 16 by bearings 21 and 22 of suitable electrical insulation. Sleeve 17 is rotatably supported, by means of a flange 23 integral therewith, arranged within a bearing 25 of electrical insulation housed within a cupped flange 24 attached to the under side of the top of box 11. Arranged about the lower end of sleeve 17 is a pulley 26 adapted to be driven by means of a belt 27 trained about a pulley 28 on the shaft of motor 12.

The upper end of shaft 16 has attached thereto a circular disc 33 having equally spaced thereabout L-shaped anode plate and fence supporting brackets such as 34 each provided with a pad such as 35 of electrical insulation. An annular anode plate 37 is arranged on pad 35 and those similar thereto and is provided with an upstanding post 38 for connection with the positive terminal of the electroplating current source.

A spiral fence 40 is suspended from the under side of the brackets such as 34 by means of brackets such as 39. The spiral fence 40 is made of electrical insulation and has its convolutions held properly spaced from one another by a number of transverse members such as 41 cemented or otherwise rigidly secured thereto. Member 41 is attached in turn to the bracket 39, as are the similarly paired like members and brackets.

The upper end of sleeve 17 has attached thereto a circular disc 43 having equally spaced thereabout L-shaped brackets such as 44 which collectively serve as a support for an annular table 45 which comprises the cathode plate of the system, and which is only slightly spaced below fence 40. The negative terminal of the electroplating current source is connected to table 45 via its supporting brackets, such as 44, disc 43, sleeve 17 and a suitable brush 31.

Articles such as 51 are conveniently fed to the table 45 in the space between the innermost convolutions of fence 40 by means of a trough 50 supplied with such articles by a vibratory feeder 52.

A deflector 53 encountered by the articles as they clear the last convolution of fence 40 forces them off the table 45, into the path of a suitably cleated rubber belt 55 occupying the space in container 13 afforded by its lip 18 and trained about suitable drums supported on shafts 56 and 57, the latter of which being driven by a motor 60.

As will be understood an article such as 51 while being carried in a clockwise direction by table 45 is gradually rolled toward the lateral margin of the table by the fence 40; and after approximately five revolutions of the table the article is near the outer margin of the table and encounters the deflector 53 which discharges the article into the path of conveyor belt 55. As will be understood since the article 51 is cylindrical its travel from the region of its deposit on the table to its outer margin is by the aforesaid rolling action which promotes a uniform plating action over the entire surface being plated.

What is claimed is:

1. In an electroplating system, a horizontally disposed article support rotatable for conveying articles to be plated through a plating solution and comprising the cathode of the system, a fixed spiral fence arranged coaxially with respect to the axis of said support immediately above said support, an anode overlaying said fence, and means for rotating said support whereby an article arranged on said support between adjacent convolutions of said fence will be urged thereby transversely of said support as it is rotated.

2. In a continuous plating system, a coating solution container, a circular disc-like article support within said container disposed in a horizontal plane and adapted for rotation about its axial center comprising the cathode of the system, a fixed spiral fence arranged immediately above said support arranged coaxially with respect thereto affording between adjacent convolutions thereof a spiral path of travel for linear articles arranged on said support between the axial and outer regions thereof during its rotation, an anode overlaying said fixed means, and means for rotating said support.

3. In an electroplating system, a circular disc-like article support comprising the cathode of the system mounted for rotation in a horizontal plane about its axial center, a rigid fence arranged in spiral form about the axis of said support with its convolutions spaced from one another to afford a spiral path for articles to be electroplated, an anode overlaying said fence, means for

rotating said support, means for feeding linear articles to be plated in end to end relation onto an area of said support located between adjacent convolutions of the spiral fence near one end thereof, means for rotating said support in a direction to move such articles toward the other end of said fence, and a container for maintaining said support, fence and anode submerged in a plating solution.

4. In an electroplating system, an article support adapted to be rotated in a horizontal plane about its axial center and whose top surface comprises the cathode of the system, means for rotating said support, a rigid fence arranged in spiral form immediately above said support and coaxial therewith for progressively guiding between its convolutions articles deposited on said support near the center thereof toward the lateral margin thereof as the support is being rotated, an anode for the system arranged immediately above said fence, and a container for maintaining said support and anode submerged in a plating solution.

5. In an electroplating system, a container for an electrolyte, a horizontal article support comprising the cathode of the system, an anode arranged over said cathode, means for rotating said support about its vertical center, and a fixed spiral fence arranged immediately above said support and coaxial therewith for guiding articles arranged on said support between the convolutions of said fence along a spiral path extending transversely thereof during their rotary travel therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

599,534	Schorke	Feb. 22, 1898
774,177	Hopkins et al.	Nov. 8, 1904
1,225,172	Privett	May 8, 1917
2,164,710	Hatch	July 4, 1939
2,274,891	Dysthe	Mar. 3, 1942
2,618,593	Rossel	Nov. 18, 1952

FOREIGN PATENTS

16,098	Great Britain	July 12, 1907